U. S. DEPARTMENT OF AGRICULTURE
FARMERS' BULLETIN No. 1135
June 1924

Rev. ed. follows

The BEEF CALF
ITS GROWTH AND DEVELOPMENT

THE PRODUCTION of a famous breeding animal or a noted winner in the show ring is a science and an art which can be attained only by those who know and admire cattle and never tire of working with them.

No doubt many a young farmer is ready to select his first purebred beef calf with the hope of developing it into such a useful and profitable individual. This applies especially to boys with experience in growing a calf for beef, and who have the necessary capital and sufficient feeds for the enterprise.

If a calf is to develop into such an animal, much depends upon the selection made, as well as the care and attention subsequently given it.

The following suggestions are offered as a guide in this undertaking and are intended primarily for the use of boys' and girls' clubs. The fundamental principles only are given, leaving the details to be obtained from other publications as experience is gained.

Available bulletins from the United States Department of Agriculture or from the State agricultural college will give much additional information.

Washington, D. C. Issued August, 1920; revised June, 1924

THE BEEF CALF: ITS GROWTH AND DEVELOPMENT

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CONTENTS

WHEN TO SELECT A CALF

THE best time to select a calf is at a few months of age, when it may be seen with its mother, or, at any rate, before it is weaned. Observe the calf's mother. If she is a wide, deep-bodied cow with plenty of size and is giving a liberal supply of milk, you may be reasonably sure that the calf, if sired by a good bull and properly cared for, will grow into a useful breeding animal. Another advantage of selecting the calf at this time is that it may be taught to eat grain before it is weaned. However, since it is difficult sometimes to obtain a calf at this age, it may be necessary to select it at weaning time or even after it is weaned, but the best time, as stated, is before weaning.

Calves are frequently classified at fairs and calf shows as "senior" and "junior" calves, depending upon the time of year they were dropped. A calf, for instance, that was dropped between September 1 and December 31 the year previous to the show would be classed as a "senior" calf, and one dropped between January 1 and August 31 previous to the show, a "junior" calf. As a rule, a fall or senior calf, on account of its age at the usual time of holding the show, is to be preferred, although there are advantages in selecting a spring or junior calf, especially one dropped in January or not later than February. This, however, depends upon the rules of the contest at which the calf is to be shown and upon the facilities at hand for feeding and caring for it.

THE KIND OF CALF TO SELECT

Choose a calf of the breed that you admire most and believe suited to your conditions, provided the community in which you live has not already adopted some other breed. You should cooperate with

your neighbors in developing one breed for your community. You will also obtain much valuable information about calves by working and advising with others, especially those who have had more experience. Select a good purebred calf. It is not sufficient that it be a purebred. It should be registered, as shown by the registration certificate furnished you by the breeder and signed by the secretary of the national association representing the breed.

In addition to being a good individual it should have good breeding back of it. Its parents, grandparents, and so on, should have been useful and profitable to their owners. These facts may be learned from a study of the calf's pedigree. To know a good pedi-

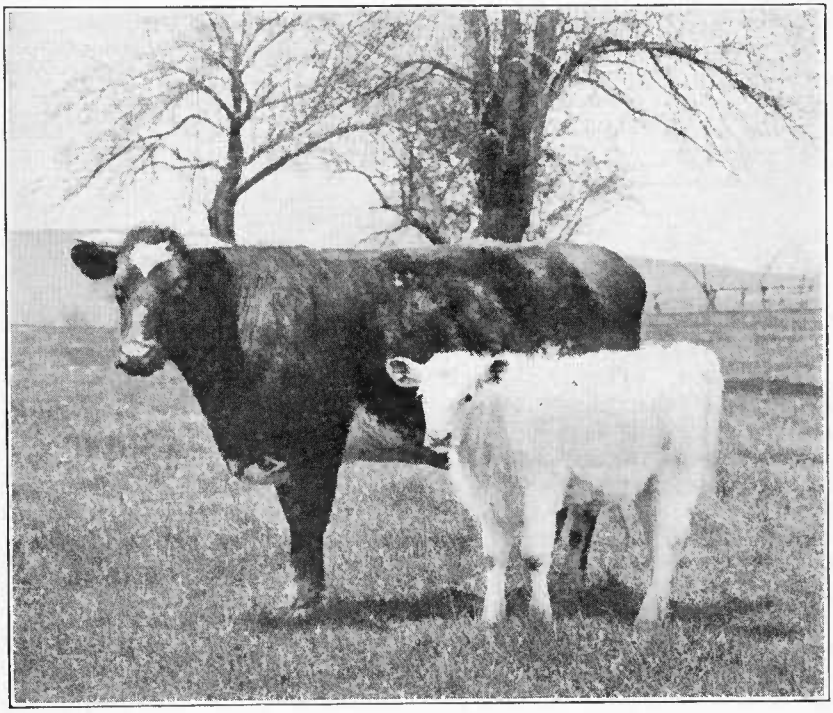


FIG. 1.—Select the calf if possible when it may be seen with its mother

gree when you see it will require some study on your part. Read a history of your chosen breed. Become familiar with individuals and blood lines which have been instrumental in building up the breed. Such information may be obtained from books sold by publishing houses, from livestock journals, or from bulletins issued by your State college of agriculture or by the United States Department of Agriculture. Much valuable information may be obtained also from the secretary of the registry association of the breed you select. The State association organized in the interest of your favorite breed will be able to assist you materially. Join such an association at your first opportunity.

Subscribe for a good livestock paper, especially the official journal recognized by the registry association of the breed chosen. Study

the advertising section. Much can be learned from the announcements of sales and auctions in regard to popular pedigrees. Examine carefully the pictures of the breed's best specimens. Become familiar with the names of the breed's noted individuals, both past and present, and look for them in a pedigree.

Attend public sales held by breeders. Study sale catalogues and note the remarks made with reference to the breeding of different animals. An appreciation of the esteem in which the breeders hold bloodlines of different individuals may be gained by noting the prices paid and the activity of the bidding on them. A word of caution here, however, may be necessary. Breeders frequently become overenthusiastic on family bloodlines regardless of how distant they may be. In analyzing a pedigree consider carefully the sire, grandsires, and great-grandsires, or parents in the first three generations, for they contribute seven-eighths of the heredity. Look for the names of famous individuals in these first three generations. Back of them the breeding should be consistent, without undesirable outcrosses. Of course the females in the pedigree must not be overlooked, but it is the bulls that determine its value to a great extent. Look for the names of noted men as being the breeders of some of these animals. Remember that a breeder becomes famous by having produced noted animals. The following is a sample pedigree showing the first three generations:

PEDIGREE OF—
Name, Idolmere.
No. 199904, volume 25, page 14.
Breed, Aberdeen-Angus.
Sex, male. Color, black.
Date of birth, January 8, 1915.
Breeder (name).
Address.

- Sire, Oakville Quiet Lad, 109220.
  - Sire, Black Woodlawn, 42088.
    - Sire, Bell's Eclipser, 20695.
    - Dam, Blackbird 13th, 24464.
  - Dam, Queen McHenry 47th, 62884.
    - Sire, Heather Blackbird, 20333.
    - Dam, Queen McHenry 5th, 17490.
- Dam, Home View Lady Idessa 2d, 86247.
  - Sire, Pabno, 38977.
    - Sire, Baltimore of Glendale, 24275.
    - Dam, Pride McHenry 6th, 23936.
  - Dam, Lady Ideal 7th, 20498.
    - Sire, Black Aristocrat, 11582.
    - Dam, Anderson Findlay Lady Ideal 3, 12330.

In every breed there are certain bloodlines that are known to "nick" well with another one. Ascertain what "nicks" or crosses have produced the best results, and look for these combinations in a pedigree. Do not be misled by family names, which in some cases are derived from a female that appears as far back as the twelfth to the fifteenth generation. Such a pedigree would carry less than one-tenth of 1 per cent of the bloodlines of this famous cow and still the animal it represents would be known as a member of the family of which this cow was the foundation. Thus it is evident that in using family names derived from the female the influence of many good bulls is wholly disregarded. Cattle breeders are fast losing sight of the family connections on the female side and are beginning to place more credit where it rightfully belongs—that is, with the bulls that appear in the first two or three generations which are entitled to recognition through performance in the show ring and breeding herd.

SELECTING THE CALF

If the calf selected is to develop into a useful, profitable individual for breeding purposes, it must be a good calf as well as the descendant

of good ancestors. To be classed as a good calf it must have the proper form, which is sometimes spoken of as "type" or "conformation." If you expect to select a calf with these necessary requirements, you should become familiar with them. Study pictures of famous animals; note their form. A score card of the breed you are most interested in would be useful. Learn the different parts of a beef animal and the method of examination in judging them.

In selecting the calf, first get an idea of its general appearance. This you may do by looking at it from a distance of from 10 to 15 feet, observing its weight or growth according to age, conformation, quality, condition, body, breed type, and general disposition. Observe it closely, beginning at the head and neck, then forequarters,

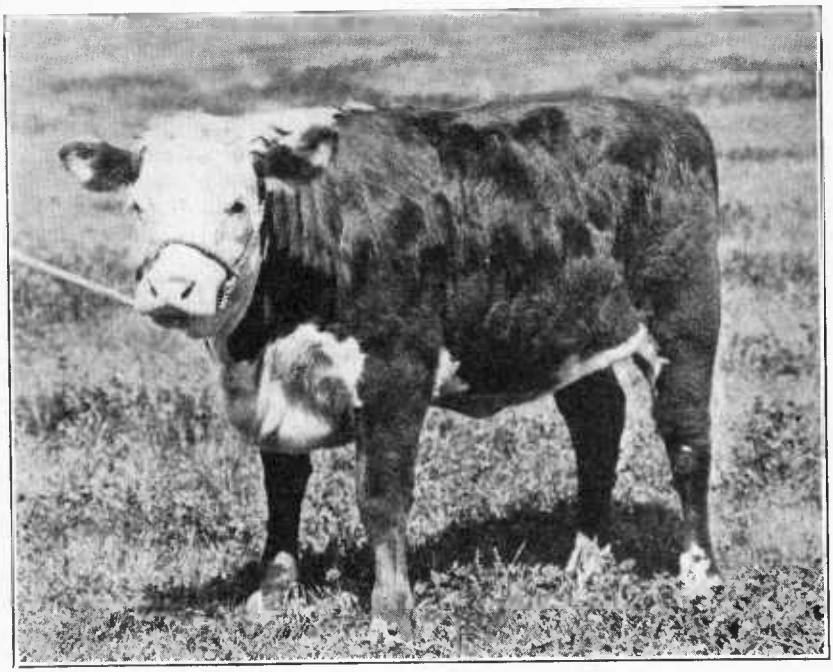


FIG. 2.—A calf of desirable type. Note the beef conformation and the excellent breed characteristics shown in this heifer

body, and hind quarters, in order named. Keep in mind that you are either selecting a calf for a herd bull or for a foundation breeding cow. If a bull is selected, it should not have the appearance of a heifer or a steer, but the strong, vigorous, masculine appearance of a bull in every detail. If a heifer is selected, she should have the feminine appearance of a good breeding cow rather than the possible coarseness or roughness of a steer.

Thus observing the calf without putting your hands on it, select one that is stylish and active. When viewed from the front it should have a short face, large muzzle, wide forehead, short neck, and a wide, deep chest, indicating a strong, vigorous constitution. When looked at from the side its back should be straight and level from top of shoulders to the tail. It should have a deep body and smooth,

long hind quarters. When viewed from the rear it should present a wide, deep appearance. While as much width as possible is desired, it should not be accompanied with roughness about the shoulders and the hips or hocks. The legs should be rather short, stout, and set wide apart. A calf that stands high from the ground, cut up in the flank, and shallow in the heart girth, has little chance of developing into a useful or profitable breeding animal.

After you have found a calf with good general appearance, have some one hold it so that you can put your hands on it. This is the best way to determine what are called "condition" and "quality." Condition means the amount of flesh and fat the calf has. Select

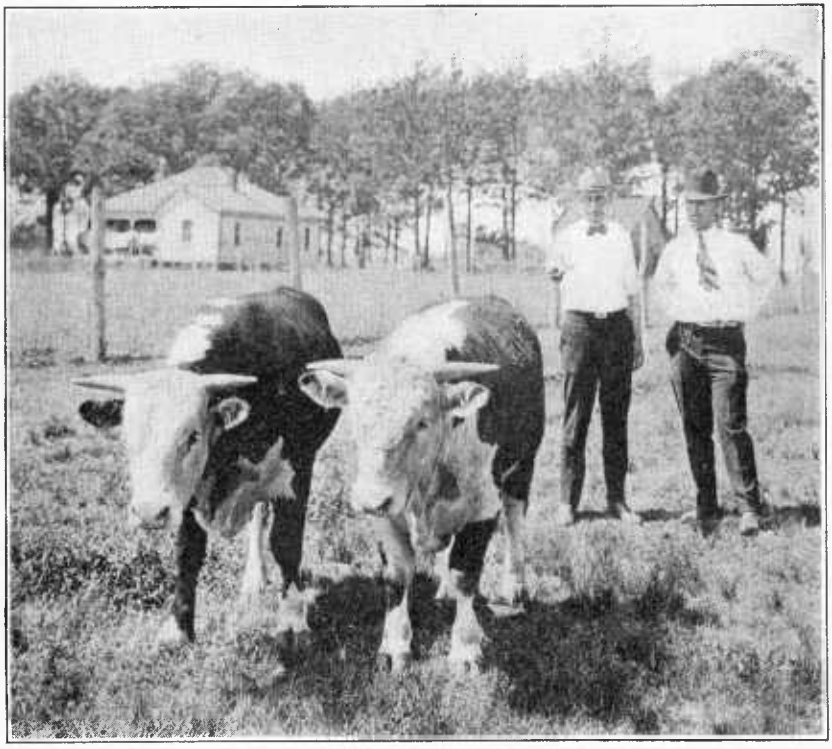


FIG. 3.—Selecting the calf for breeding purposes. It can easily be seen which of the two calves is being chosen

a calf in good growing condition but not excessively fat. The beef calf for breeding purposes should have great depth of natural flesh and be free from roughness or coarseness in any way. By running the open hand along the back and sides with a slight pressure of the finger tips the amount and quality of condition may be determined. A calf in proper growing condition, while not possessing the depth of flesh of a mature animal, should have a smooth, even covering of firm though not hard flesh along its back and sides and over the shoulders.

Quality may be determined by the eye of the experienced judge, but the hand may also be used to advantage. All the following

indicate quality: A thick coat of hair that feels soft and silky and looks glossy; a loose, pliable skin that does not seem thick, rough, or tightly stretched over the body; and rather short legs that appear to have strong, clean bones without roughness or coarseness.

A calf showing early maturity, as indicated by the tendency to put on an even covering of rather firm flesh, is desirable, and should be selected if possible.

Color is of little importance so long as the calf selected has the approved color of the breed desired. There are, however, popular shades and color markings of the different breeds, which you will learn from further study of the breed selected.

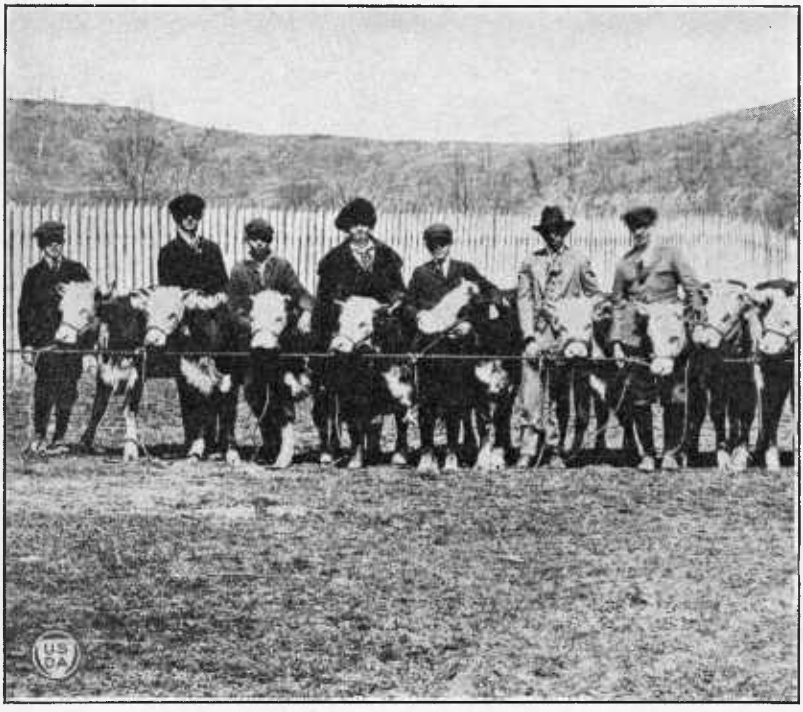


FIG. 4.—Young people exhibiting calves in a beef calf club contest

EQUIPMENT NEEDED FOR GROWING THE CALF

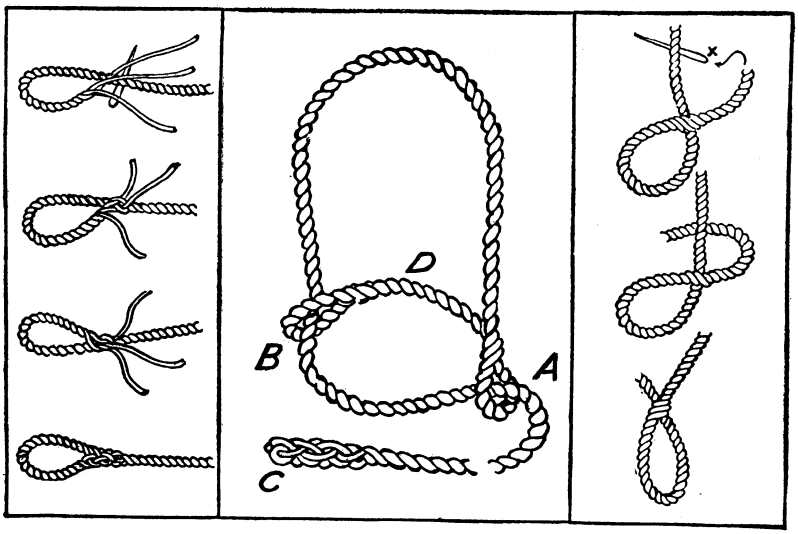
The necessary equipment to feed and care for the calf properly should be provided. This equipment need not be expensive, but it should be convenient. The barn or shed in which it is kept should be cool in summer and dry in winter. An especially warm barn is not necessary, but cold winds and rain must be kept out.

The fences around the pasture where the calf grazes should be kept in good repair. Do not teach the calf to jump or be a rogue by allowing it to run at large or to go through or over poor fences. It is better to have a gate for it to walk through than bars to jump over.

The calf may graze with other cattle on pasture, but should be fed grain separately. A bull calf should be separated from the heifers

at about 3 or 4 months of age. He should be kept with other bull calves or older cattle for company except at feeding time. The calf should then have a separate stall or pen. The stall or pen should be so arranged that the calf may see other calves or cattle to keep it from fretting when alone.

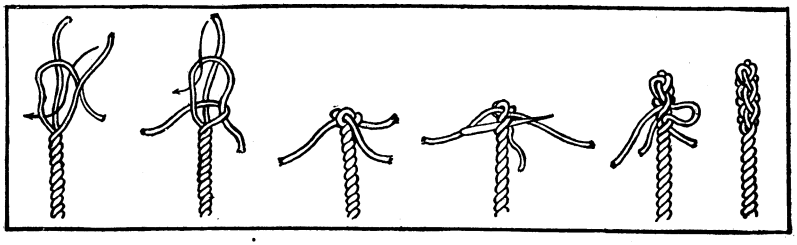
The stall should be kept clean and dry at all times. If the ground in or about the stall is low and wet, broken stone should be used to



Steps in making eye splice B

Completed halter. A, eye splice; B, loop splice; C, crown knot; D, nose piece

Steps in making loop splice A



Steps in making crown knot, C

FIG. 5.—A completed rope halter, and steps showing method of making. A marlinspike (a small pointed piece of iron or hardwood) is used to separate the strands. Make the loop splice first, because a completed eye splice will not go through it readily. The loop spice should be far enough from the eye spice to form the nose piece. Then make the eye splice, which should be just large enough to allow the rope to pass freely through it. A more detailed description will be given upon application

raise it to keep it dry. Small stones or gravel or preferably clay should be put on top and firmly packed down. Use plenty of straw, leaves, shavings, or other litter for bedding, so that the calf may be induced to lie down a large part of the time. A calf will not thrive and do well if made to sleep on a damp, foul-smelling bed. If the lot where the calf takes its exercise in winter is wet and muddy, the water should be drained off through ditches or otherwise disposed of.

The feed manger for the hay and silage should be convenient and large enough to hold all the feed given, so that it will not be crowded out and wasted. The manger should have a tight bottom to hold the small particles of hay, especially the leaves, as they are the most valuable part. The feed box for grain needs to have a tight bottom and be large enough to prevent loss while the calf is eating. If some of the feed is lost, the cost of gains in weight will be greatly increased. The appearance of the calf usually reflects any negligence on the part of the owner.

If the calf is watered from a trough or a stream, the place should be kept clean. Do not allow mud to accumulate about the approach to it. The overflow water from the trough should be drained to one side. Broken stone may also be used about the trough or the entrance to the stream to keep it free from mud and attractive, so that the calf will want to drink an abundance of water. If a pond or a spring is used, do not allow the calf to stand in it, as that will dirty the water. Diseases of the feet may also be contracted about dirty watering places. If the calf is watered from a well or a spring by a bucket, provide one especially for that purpose. Do not use the bucket for any other purpose or any other animal.

A bin or box for storing the grain should be provided. It should hold the grain supply for several weeks as mixed and weighed up. Keep the box in a dry, convenient place. It should have a hinged lid that will close tight to keep out chickens, rats, and other animals. Arrange in a convenient place a small box in which to keep salt at all times.

A fork will be needed to keep the stall clean and to handle hay or other roughages. A large basket will be convenient to use in weighing and feeding the silage.

Other items of equipment needed in caring for the calf are currycomb, brush, coarse-tooth comb, burlap blanket, halter, and clippers or shears for trimming hair. A very strong, cheap, and serviceable halter, one which every boy should be able to make, is shown in Figure 5. To make the halter use from 12 to 14 feet of $\frac{5}{8}$-inch manila rope; sharpen a hardwood stick, called a "marlinspike," as illustrated, to separate the strands. The different steps in making the halter are shown in the figure.

KEEPING THE CALF HEALTHY

Most calf ailments are due to improper feeding or insanitary conditions, or both. Keep the calf out of cold rains in winter as much as possible, and provide a dry, well-bedded stall at night. Provide nature's tonics—exercise, sunshine, pure air, abundance of fresh water, and a variety of feeds, and there will be little need for medical attention. It is not for the purpose of curing diseases that these suggestions are offered, but to prevent their occurrence. Observe the calf closely at all times. If it should appear drowsy, feverish, stiff, or sluggish, act quickly. Reduce feed at once and the disorder may be in a large measure prevented. Keep salt before the calf at all times. An abundant supply of fresh water should be available always. Some of the commoner ailments only are briefly discussed here, with a few suggestions for first-aid treatment. In case of serious illness consult a competent veterinarian at once. Do not delay.

Constipation.—Occasionally when the newborn calf fails to get the colostrum or first milk from the cow its bowels remain inactive, and the meconium (first droppings) are retained, which causes constipation. An enema or injection into the rectum of 1 quart of warm water in which 1 teaspoonful of common baking soda or one-half teaspoonful of common salt has been dissolved will usually give relief. Use a syringe or allow the solution to gravitate through a small rubber hose or funnel. Two tablespoonfuls of castor oil may be given, and repeated if necessary.

The solid droppings of an older calf should be observed daily. If they appear extremely solid, the animal is constipated or feverish. With older calves this condition may be relieved in most cases by promptly providing plenty of water, by reducing the grain and dry roughage and substituting a more laxative ration. A small quantity of linseed-oil meal, wheat bran, and legume hay, such as alfalfa, soy bean, or lespedeza, may be used. If this does not relieve the condition, give castor oil or raw linseed oil, one-fourth pint, or Epsom salt in doses according to the age of the calf, although dosing should be avoided as much as possible.

Diarrhea or "Scours."—If constipation is not relieved diarrhea or scours may follow. This ailment is indicated by thin, washy, offensive droppings. It is usually the result of improper feeding, irregular suckling, or overfeeding with anything that overloads the stomach. Damaged grain fed to the calf, or even to the cow before the calf is weaned, may cause digestive disorders. Exposure or overheating may also be a predisposing cause. Silage, alfalfa hay, and possibly linseed-oil meal, when fed in large quantities to older calves for a long period, may cause this condition, which should be corrected by an immediate reduction of such feeds and the substitution of dry grass hays and a little cottonseed meal for a part of the ration. If such conditions occur with a calf not yet weaned, reduce the milk allowance and withhold all grain. In severe cases withhold all feed for 12 hours. As a last resort put the cow on dry feed entirely and let the calf suck another cow.

Remedies easily obtained for the small calf are castor oil, 1 tablespoonful to one-fourth pint, depending upon the size of the calf, given as a drench with warm, sweet milk, followed by 1 teaspoonful of a mixture of 1 part salol and 2 parts subnitrate of bismuth. Another remedy used with success is 4 drops of formalin to 1 quart of warm milk. Commonly used home remedies include whites of 2 raw eggs or a weak solution of limewater given in 1 or 2 tablespoonful doses. Feed and manage the calf so as to prevent diarrhea or scours. Such disorders stop the growth of the calf for several days at least and make it more susceptible to them later.

Blackleg.—Blackleg is an infectious disease associated with external swelling, usually about the forelegs or shoulders, and which emits a crackling sound where handled. The germ causing the disease is widely distributed throughout most sections of the country. Young cattle between 6 months and 2 years of age are most likely to take the disease. Calves under 6 months old are rarely attacked. Blackleg is controlled by vaccination. All animals should be vaccinated before they are 6 months old and again 6 months later. Information concerning the distribution of vaccine may be obtained from your State veterinarian. Further information will be found

in Farmers' Bulletin 1355, Blackleg, of the United States Department of Agriculture.

Lice.—It is not a reflection on the owner for his calf to have lice on it, but to allow them to remain there is a serious reflection. They not only annoy the calf but lower its vitality to resist diseases and disorders, and prevent normal growth. The hair of a calf infested with lice is usually rough, stands on end, and lacks the glossy appearance of the coat of a healthy, well-fed calf. The calf may become infested with two kinds of lice—blue and red. The one sucks, the other bites the skin. If a calf becomes infested with lice they should be removed at once. This may be done by dipping early in the spring or fall. As the lice reproduce from eggs, a second dipping in each case, from 10 to 14 days after the first, is recommended.

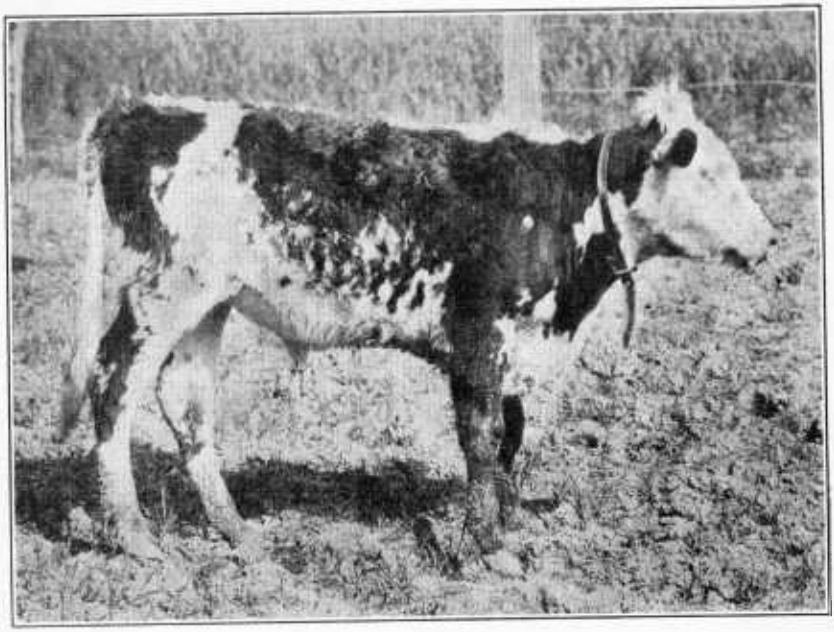


FIG. 6.—A lousy, mangy calf. A calf to make the best growth must be free from lice and other parasitic pests

Since but few dipping vats are available in most sections, it will be necessary to wash or spray the calf thoroughly with some good coal-tar, tobacco, or oil-emulsion dip prepared for the purpose. A home remedy frequently used is a mixture of one-half pint of kerosene and 1 pound of lard, applied by thoroughly rubbing into the hair, especially about the neck and shoulders. This remedy, like dipping or washing, is not advisable for small calves in cold, wet weather. An effective powder which may be used any time is prepared as follows: Mix gasoline 3 parts, carbolic acid 1 part, and plaster of Paris enough to take up the liquids. Make a paste and allow to dry. Powder and shake into the hair thoroughly from a shaker or duster. (CAUTION: *Do not mix near a fire.*)

Mange.—Small mites which attack the skin and cause it to become thickened and covered with crusts and scabs greatly annoy the calf

and cause it to rub or lick itself constantly with consequent loss of hair about the tail, neck, and shoulders. The mites multiply rapidly and are spread from a diseased to a healthy calf by the animals running together or occupying the same stall or pen.

The treatment is to dip or wash the calf the same as for lice, with a lime-and-sulphur, tobacco, or oil-emulsion dip. A mangy calf, like a lousy one, never makes satisfactory gains nor a creditable showing. The hair is usually rough and the skin thick and coarse, which gives the calf an appearance of one lacking vigor and general thrift.

FEEDS FOR THE CALF

The beef calf is able to use to advantage many coarse, cheap feeds produced on the farm. It is a mistake, however, to think that a prize winner or the most profitable breeding animal can be grown on pasture, stover, or hay alone, for such is not the case.

Feeds which the calf should have are divided into two groups. One is called "concentrates," the other "roughages." The concentrates include either whole or ground grains and their by-products, such as corn, oats, barley, velvet beans, rye, milo, kafir, bran, cottonseed meal, cottonseed cake, peanut meal, and linseed-oil meal. Roughages are of two kinds, dry roughages, such as hay, stover, and straw, and succulent roughages, which include silage and root crops. Pasture grasses or plants such as blue grass, Bermuda, lespedza, clover, alfalfa, and prairie grass are classed as succulent roughages, also winter pasture, which may be obtained by grazing oats, wheat, rye, soy beans, cowpeas, velvet beans, or other crops sown to mature at the time pasture is desired.

All feedstuffs used should be clean and free from mold, mustiness, or any condition that would make them unpalatable or possibly disturb the digestive system of the calf.

Special kinds of feeds or combinations of feeds are necessary for the proper growth and development of the calf. Some are best suited for the production of fat, some for the production of muscle, hair, and hide, while others should be used for the growth of the bones or framework of the body. Different feeds, therefore, have different values and functions for calf feeding. Unless the calf owner has already gained from study and experience a knowledge of the use and value of different feeds he should learn these things, at least in a general way, in order to be able to feed most successfully and cheaply. This is especially true of concentrates. A better idea of their use and value for different purposes may be formed by dividing them according to, first, their protein content, and, second, their carbohydrate and fat content. Most feeds contain protein, carbohydrates, and fats, but many are deficient in some one of these important compounds and for this reason are given special consideration.

Protein is part of the feed which when eaten by the calf goes to make lean meat, hair, and hide. Carbohydrates and fats, while different in character and value, are both used for the formation of fat, and for this reason are spoken of or classed together as carbohydrates. Those concentrates which are high in carbohydrates and fats usually contain little protein. Mineral matter, used in the formation of bones, lean meat, and blood, is also a very essential part of

feeds. A sufficient amount is usually present in most feeds, especially if legume hays and a variety of concentrates are fed; so it is not further considered.

In many instances legume hay, such as clover, alfalfa, and lespedeza, which contain a large proportion of protein, are used to supply a large part of the protein needed in the ration. Hays and roughages in general, both dry and succulent, should also be used in a ration, for the reason that they keep the animal's digestive system in a good, healthy condition. In a general way, feeds, both concentrates and roughages, are classified according to their protein and carbohydrate value, as follows:

Protein Feeds

CONCENTRATES	ROUGHAGES
Cottonseed meal.	Alfalfa hay.
Linseed-oil meal.	Clover hay.
Velvet beans.	Lespedeza.
Peanut meal.	Peanut hay.
Soy beans.	Legume forage.

Carbohydrate Feeds

CONCENTRATES	ROUGHAGES
Corn.	Grass hays (timothy, Johnson grass, prairie, etc.).
Oats.	Straws (wheat, oat, etc.).
Barley.	Corn or sorghum stover.
Kafir.	Corn or sorghum silage.
Rye.	Roots.
Milo.	Pasture grasses.
Feterita.	

In making up a ration (feeds for one day) for the calf it is always advisable to use at least one kind of feed containing a large amount of protein and two or more containing carbohydrates, such as corn, oats, or barley. When feeds from the two groups are used, both of the important nutrients are provided. A ration which thus contains the proper quantity of both protein and carbohydrates is called "a balanced ration" and should always be fed when possible.

FEEDING THE CALF TO WEANING TIME

The feeding of the calf from birth until it is weaned is a very simple matter if its mother gives milk enough to nourish it properly. The principal part of the calf's ration, therefore, may be cheaply and safely provided by giving its mother the proper feeds for the production of milk. Do not feed the cow too heavily on grain soon after she has dropped the calf. While it is important that the calf have plenty of milk at all times, it should never have too much, especially soon after birth.

A calf dropped in the fall or winter usually will do better if kept separated from its mother and allowed to suck night and morning. In summer it should be provided with a lot for exercise and pasture in the daytime, and during the winter with a well-bedded box stall at night. When the calf is from four to six weeks old it is a good plan to bring it from the lot early in the morning, allow it to suck, then take it to the pen or stall to be fed some grain. It should also

be suckled at night before grain is fed, then taken out to the grass lot or be fed a little hay in the stall. To keep a calf contented when away from its mother, it should run with other calves. A bull calf should be separated from the heifers at the age of three or four months. If the calf is dropped late in winter or spring it may be more convenient to allow it to run with its dam for several months on pasture.

Since milk is nature's food for the calf it would be reasonable to suppose that milk alone is sufficient feed for it. In all cases, however, it should be provided with a little grain in addition to milk. If both the cow and the calf have good pasture and the cow is giving milk enough, the calf will grow to weaning age in good condition with less grain than otherwise would be needed. Frequently, however, the amounts of both pasture and milk are somewhat limited. Then the feeding of more grain is absolutely essential for best results.

When from four to six weeks old a calf may be taught to eat grain. This may be done by feeding it in a creep or pen to which the cow does not have access. Wheat bran is an excellent feed for this purpose. A good ration for the first few weeks would be coarsely ground corn, oats, and wheat bran, equal parts by weight, with a small quantity of oil meal added every few days. Feed the calf at first one-fourth of a pound of grain a day, or just what it will eat up clean, giving one-half of the amount night and morning. After a few weeks a ration of whole oats 4 parts, shelled corn 2 parts, and oil meal 1 part by weight should be substituted for the ground feeds. The calf should be eating from 2 to 3 pounds of grain a day when 6 months old, or approximately one-half to 1 pound of grain per 100 pounds live weight.

Unless the cow has been giving sufficient milk previous to this age of the calf, it may be advisable to provide a nurse cow for the calf. To make the most satisfactory growth the calf should have a liberal supply of milk for several months longer. This is especially true if it is to make a maximum growth and show to the best advantage when the fair season arrives. By being fed in the way described, it should make a continuous growth from birth. If weaned properly, so that none of the calf fat or bloom is lost, the chances for it to grow out and make a profitable and useful animal are decidedly in its favor.

The calf is old enough to wean when from 8 to 12 months old. Weaning should take from 12 to 15 days, and should be done gradually. When old enough to wean allow it to suck once a day for a week, then every other day for four or five days, and increase the interval until no milk at all is allowed.

FEEDING FROM WEANING TO MATURITY

The feed, care, and management which the calf should receive after it is weaned will depend largely on the time of year it was dropped. A spring calf should be fed differently from one dropped in the fall. It is assumed that in either case, however, the principal part of the calf's feed for the first few months was its mother's milk. In addition to the milk it should have been fed grain so that at

weaning time it would be getting from 2 to 6 pounds, depending upon the age of the calf and time of year when weaned, with a little silage and a liberal amount of hay as well.

If the calf has not been taught to eat grain before it was weaned it should be taught at once. Begin by feeding it as recommended for the calf before weaning. The amount of feed, however, may be increased more rapidly than with the unweaned calf. In a month or six weeks after it is weaned it should be eating from 4 to 6 pounds of grain with 10 pounds of silage and from 2 to 3 pounds of clover hay, with a small amount of other roughages like stover or straw in addition, unless sufficient pasture is available.

A standard grain ration for the calf may be made by using corn, oats, and bran, equal parts by weight, or corn 5 parts and oats or bran 3 parts by weight, with 1 part of linseed-oil meal added to both unless the ration seems too laxative. It is expected that in many cases all these feeds will not be available. It will be necessary then to substitute other feeds. The following substitutions are recommended:

Feed	Substitutes
Corn	Barley, kafir, milo, oats, or other feeds high in carbohydrates and fats.
Oats	Bran, ground oats, coarse middlings.
Bran	Ground oats, coarse middlings.
Cottonseed meal	Cottonseed cake, linseed-oil meal, peanut meal, velvet-bean feed, soy-bean meal, or other feeds high in protein.
Corn silage	Sorghum silage, other silage, roots or mangels.
Clover hay	Alfalfa, lespedeza, peanut vine, soy bean, or grass hays.
Corn stover	Oat straw, other straws or stovers.

The quantity of grain to feed should be determined at all times by the appetite of the calf. Feed what it will clean up in a short time and wish it had just a little more. A variety of hays should be provided if possible. While the beef calf can use cheap roughages to advantage, good hays, preferably legumes, such as clover, alfalfa, and lespedeza, are more satisfactory. Well-cured, bright, corn stover or oat straw may be used to supply a part of the roughage needed and keep the calf's appetite good and its digestion in proper order. Give as much hay as it will consume, but do not allow any waste. If the calf is on good pasture it will not consume much hay. As it increases in age it can be fed silage to advantage. Avoid overfeeding with silage, as there is danger of digestive disturbances, especially when getting a liberal supply of milk.

Pasture should be provided at all times. Next to milk it is nature's balanced ration. Sufficient pasture may be obtained from such pasture plants as blue grass, Bermuda, lespedeza, carpet grass, clover, alfalfa, and prairie grass. Late fall, winter, or early spring pasture may also be obtained by grazing such crops as rye, oats, wheat, soy beans, cowpeas, and velvet beans. Use great care in pasturing legumes, such as alfalfa and the clovers, also winter pasture crops. Turn the calf on such crops for only a short time at first, because the calf may bloat from overeating on such feeds. After it becomes used to them it may graze with safety.

RULES OF FEEDING

There are many things to remember in feeding the calf. They may be called rules of feeding and should be carefully followed.

1. **Provide a variety of feeds** at all times, if possible. It is easier to supply the proper amounts of the desired nutrients which the calf needs, if several different feeds are used. The ration will also be more palatable.

2. **Do not make sudden changes** in the feeds used or in the amounts given. If it becomes necessary to change feeds from, say, clover to alfalfa hay, feed part clover and part alfalfa for a few days. Gradually reduce the amount of clover and at the same time increase the alfalfa.

3. **Do not overfeed the calf.**—Feed as much grain as it will clean up in 30 minutes and wish it had just a little more. Feed left in the trough to be breathed over is worse than wasted. If any remains it should be removed and less given the next time. Digestive disorders occur from feeding too much rather than too little.

4. **Do not underfeed the calf.**—It should make a continuous gain. If it does not grow each day the feed given it is about the same as wasted. It never pays to starve a calf. In fact, the calf does not begin to pay for feed until it is given enough to make some gain.

5. **Do not annoy or disturb the calf unnecessarily.**—The fattening or growing calf should be kept as quiet as possible. It requires more feed to keep it growing while standing or moving about than while lying down at rest.

6. **Do not feed moldy, musty, or spoiled feeds.**—To do so may cause serious digestive disorders. All hays should be bright, well cured, and free from mustiness, dirt, and coarse weeds. The grain also should be free from dirt, mold, and mustiness. If ground feeds get wet they are likely to mold. This is especially true of cottonseed meal and ground corn. They should not be fed if in bad condition.

7. **Do not waste time in feeding the calf.**—To waste time in feeding or preparing feeds needlessly increases the cost of gains. Grain should be fed whole except when teaching the calf to eat and possibly also near the end of the fitting or finishing period. Whole grain as a rule is more palatable than ground feeds. Ear corn may be shelled, broken, or chopped up in the feed box rather than ground. Husks on snapped corn need not be removed for this purpose. It rarely pays to shred stover or to cut or chaff hay for the calf. It need not be fed three times a day when twice a day will do as well, although the former may be practiced when fitting the animal for show or sale. Do not go to the expense of buying prepared "stock feeds" or "remedies." Home-mixed feeds are cheaper and equally, if not more, satisfactory. A healthy calf does not need condition powders.

PREPARING FOR SHOW OR SALE

When a well-fed and properly developed calf is brought into the show or sale ring it should present a pleasing appearance. In order to do this it should be clean, well groomed, halter broken, and trained. To train a calf, put a halter on it and teach it to lead and to stand squarely on all four feet with head alert so as to exhibit its best features. It should become accustomed to being handled by strangers,

seeing strange sights, and hearing unusual sounds, such as it will see and hear at the show or sale. A good calf is frequently placed below an inferior one because the judge can not put his hand on it to judge it correctly. The trained animal that stands correctly and "poses," so to speak, has the advantage over one that flinches, kicks, pulls on the halter, and stands with its feet in such position as to give the appearance of a weak back, narrow chest, and poorly developed rump.

For a few months before the show the calf may be fed three times a day with good results. Some feeders use molasses, chopped feeds, and wet mashes. As a rule, however, more satisfactory results will be obtained from using a good combination of the common feeds produced on the farm. The healthy, normal calf will make sufficient

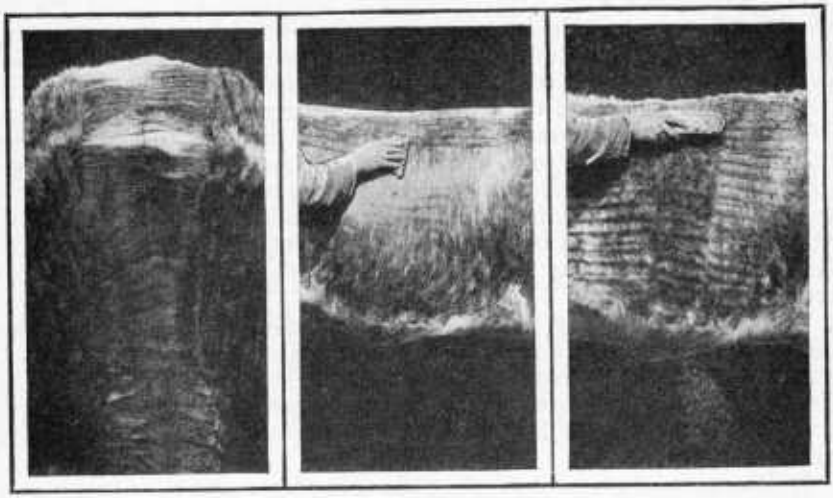


FIG. 7.—The hair is first parted along the back before curling

FIG. 8.—Making the parallel lines along the sides to curl the hair

FIG. 9.—Brushing up the tips of the hair to give the fluffy, wavy appearance

gains and have a desirable finish with such feeds without coaxing or tempting its appetite.

The calf should be kept in a cool barn during the day and allowed to graze at night for a few months previous to the show. The hot sun from June to September will "sunburn" the hair and cause it to appear somewhat dead, rough, and coarse, and to lose its glossy appearance. Burlap bags suspended by wires from above for the calf to brush against may be used to advantage to repel the flies which greatly annoy a calf. The stable also may be darkened and many flies kept out by tacking burlap sacks over the windows and doors. If in the pasture, the calf should have plenty of shade.

A few weeks before the show the calf may be blanketed to advantage. The blanket, which is usually made of burlap, is used mainly to keep flies from worrying the calf, to give the hair a more glossy appearance, and to help mellow or soften the hide. The burlap used for this purpose should extend from the neck to the tail and come down over the sides.

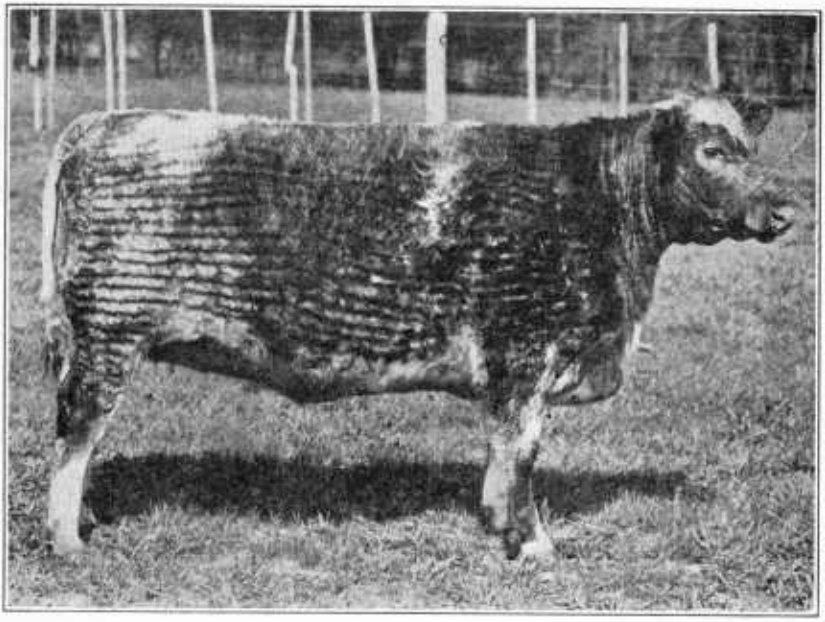


FIG. 10.—A properly fitted Shorthorn, showing the wavy appearance of the long hair

When the calf is taken from its stall before the judge at the show, it should be clean and carefully groomed. The use of sufficient bedding will help to keep it clean. Do not wait until time to bring your calf into the show or sale ring before cleaning it up, but begin sev-

FIG. 11.—The round comb may be used to curl the hair of the Hereford

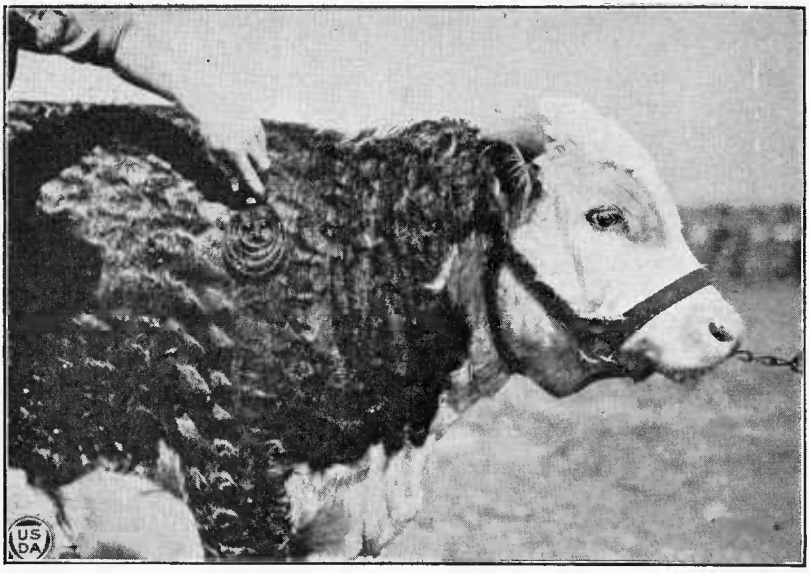


FIG. 12.—Catching the tips of the hair or combing up to give the wavy appearance

eral hours before the time announced for the class to appear. The calf should be washed every few days, and occasionally with warm water and tar soap. Make a good suds in the water and then add more soap to the hair. Rub and work the hair with the hand or brush until all dirt is worked loose. Wash the suds and dirt out with cold water. Frequent washing keeps the animal clean, stimulates a heavy growth of hair, and makes it loose and fluffy.

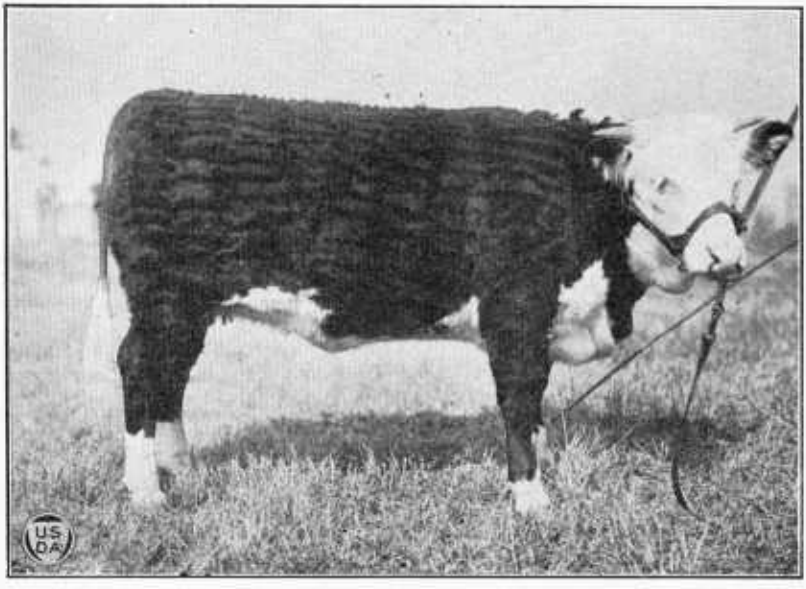


FIG. 13.—Herefords are usually shown with the hair curled

The calf should be groomed or thoroughly brushed each day for several weeks before the show. Brushing lengthwise of the body with considerable pressure will help work the hide loose and pliable and gradually remove the old hair. The final brushing on a short-haired calf should be in the same direction as the hair, the hand each time following the brush. The hand will draw the oil to the tip of the hair. A woolen cloth may be used to advantage in removing the dust and the dirt. The final brushing for the long-haired breeds (Shorthorn, Hereford, Galloway) should be opposite to the direction of the hair to make it loose and fluffy. Short-haired animals (Aberdeen-Angus, also Red Polled, and Devon) are shown with the hair smooth. Animals with long hair are shown with the hair curled.

An hour or two before the calf is to be shown moisten the hair with a mixture of creosote dip and soapy water. Do not make the

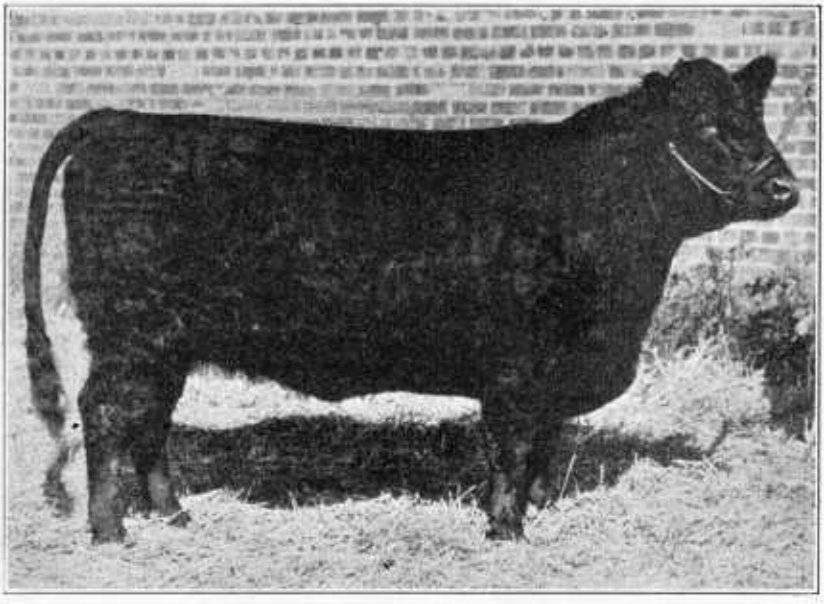


FIG. 14.—The Galloway is usually shown with the hair curled

hair too wet or it will appear in locks instead of loose and fluffy. The hair on the center of the back should be parted with a coarse comb along the backbone in one straight line from the neck in front of the shoulder to the tail. Comb the hair on each side at right angles or straight out from the center parting to the extreme edge of the flat portion of the back. Mark the hair with the comb or brush from in front of the shoulders to the tail or extreme back of the round. The lines should be on the outer edge of the flat portion of the back so the end of the hair will curl up even with the level portion of the back and make the back appear wide. The lines should be about $1\frac{1}{4}$ inches apart, distance depending upon the size of the calf, and parallel to the first line. After considerable experience the curling of the hair may be done with the currycomb alone. A round one is best for this purpose. After all the lines are made the

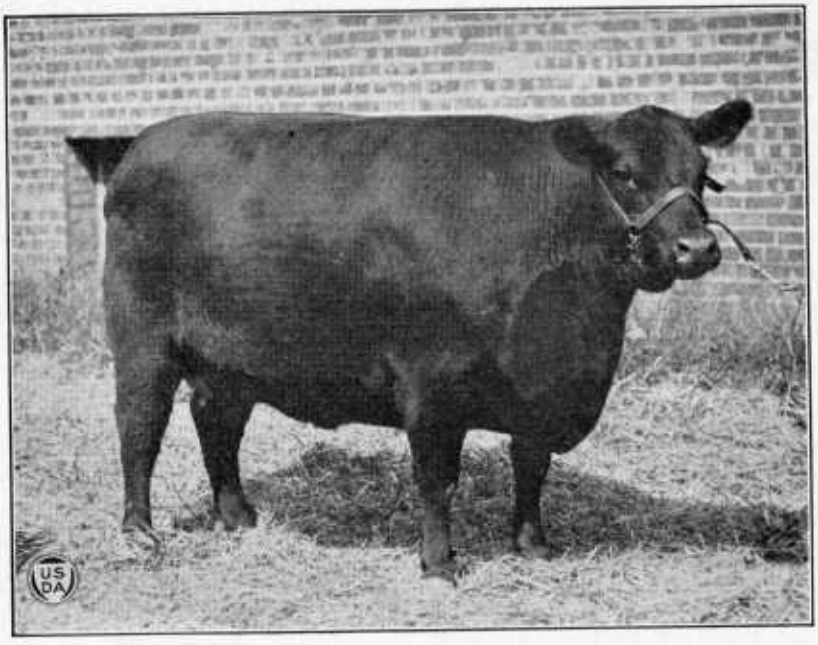


FIG. 15.—The Aberdeen-Angus is usually shown with the hair smooth

hair that was combed back in making the marks should be lightly brushed up with a brush or currycomb. This will leave the hair in distinct wavy lines as desired. The hair on the flanks and defective places should be brushed up to fill them out. The Aberdeen-Angus is shown as illustrated in Figure 15.

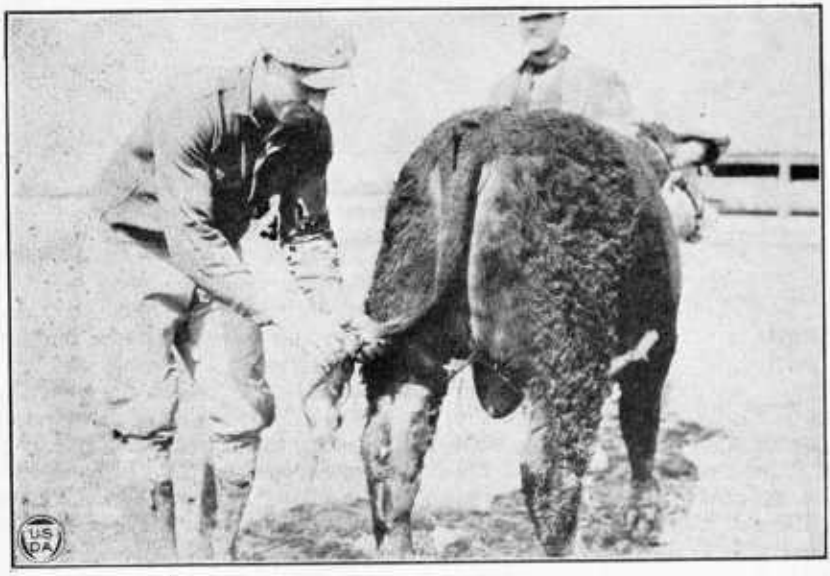


FIG. 16.—Method of clipping the hair from the tail

If the hair does not have the desired shiny or glossy finish, dampen a cloth with a mixture of equal parts of olive oil and denatured alcohol. Apply this lightly on the hair, following with the hand to give it a proper finish.

Clip the long hair from the tails of all breeds a few weeks before the show or sale, also from the ears except the Galloway and in some cases the Aberdeen-Angus. Begin clipping above the switch of the tail even with the point where the fullness of the twist begins to fail, and up to the tail head, gradually tapering the tail off at the top so that it is not necessary to clip any hair off the rump. One of the main objects of clipping the tail is to show the fullness of the twist and the thickness or beefiness of the hind quarters. Your own judgment should determine the extreme points that will show these characteristics to the best advantage with each individual. Two or three weeks before the show clip the hair on the head of the Aberdeen-Angus from a point just back of the jawbone and 3 or 4 inches back of the ears (see fig. 17). Do not cut the eyelashes or the hair on the nose.

FIG. 17.—The head of the Aberdeen-Angus is clipped in front of the line shown, which may also include the ears. The eyelashes should not be clipped

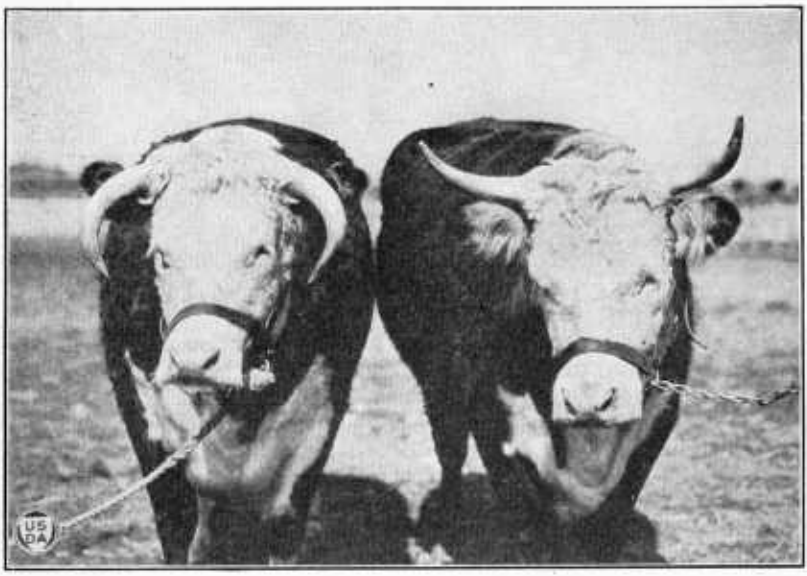


FIG. 18.—Note that properly (left) and improperly shaped horns (right) make considerable difference in the appearance of the animal

The feet should be kept clean, free from soreness, and in trim. A calf can not stand or walk properly if the feet are sore or out of shape. If the toes are too long the hoof must first be trimmed by tapering the bottom properly from back to front, thus leveling the hoof. This can be done with a chisel or hoof clippers. The hoof may be smoothed off with a file or rasp and polished with sandpaper or emery dust and oil. A mixture of oil and lampblack makes a suitable hoof polish. The feet of calves that stand in the stable, especially if not kept clean and well bedded and given frequent exercise, may become tender or even sore and diseased. The calf in such cases may walk lame, which is to its disadvantage. Sore or

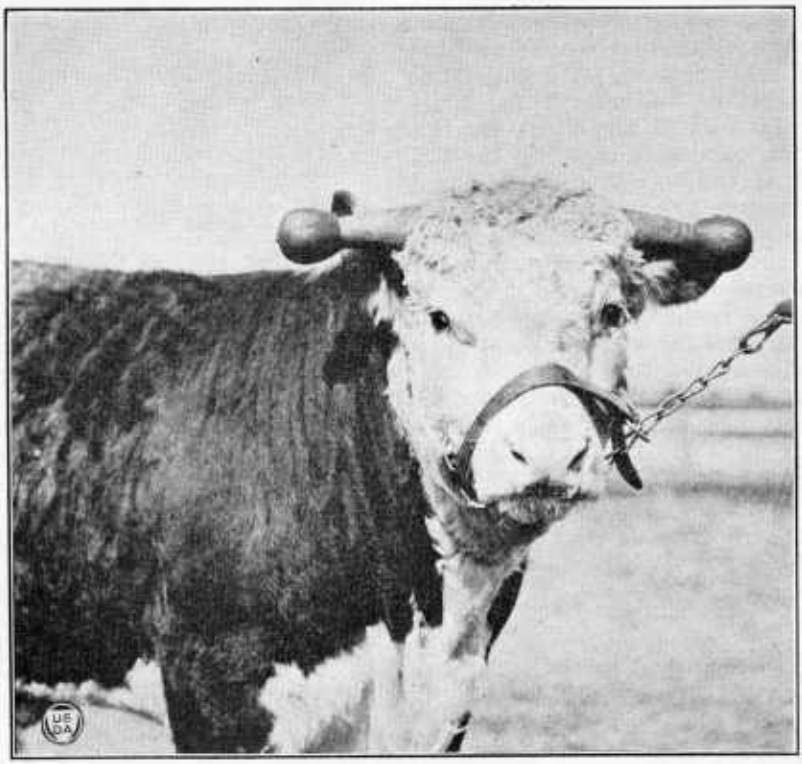


FIG. 19.—Weights are used to train the horns

tender feet may be prevented by frequent exercise on the ground, clean quarters, and properly trimmed hoofs.

On the horned breeds a well-curved set of horns commands the admiration of the judges and the consideration of the buyers. (See fig. 18.) The plain-headed animal of the horned breeds or one with poorly shaped horns will be at a disadvantage in the show ring and discounted by the individual buyer unless the horns have the proper shape. A symmetrical, properly curved set of horns can be obtained by the use of either weights or trainers, each of which has its advantages and disadvantages. (See fig. 19.)

As soon as the horns are long enough and sufficiently strong to bear the weight, it is time to begin with a light one. Use care to

see that they are not put on while the horns are too young and soft. If the horns yield too quickly it is better to remove the weights and give the horns a rest of from 10 days to a month, depending upon the condition of the horns. Then replace the weights, until the desired effect is obtained. When the horn gets below the level of the top of the head the direction of the ultimate growth will usually be decided. Skill in horn training is acquired by practice. The size of the weight to use can be determined only by study and experience.

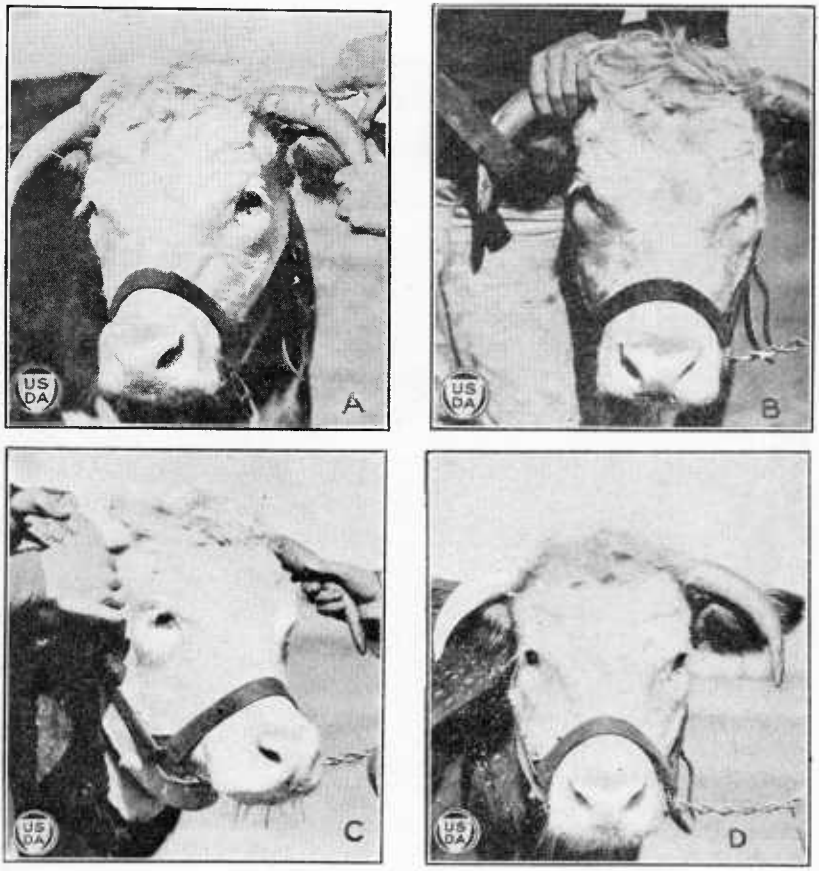


FIG. 20.—Trimming and polishing horns. (A) The rough scaly portions may be removed with a sharp knife. (B) The rasp is used for the greater part of the trimming. (C) Sandpaper is useful in smoothing the horn. (D) The right horn of the animal is properly trimmed and polished. Polishing may be done by the use of a woolen cloth moistened with a vegetable oil

The horn trainer, which is a mechanical device for drawing in and down the horns that stand out and up, should be applied while the horn is growing—as soon as it is seen that the horn is not developing properly. To attach, place the rings on the horns, being sure that each ring is the same distance from the head at the base of the horn. Fasten the straps securely and tighten the screw until it sets firmly in place on the horns. In some cases, when the horns have been neglected, it may be necessary to file one of the horns, as

one may have grown larger in diameter than the other, preventing the rings from being a uniform distance from the base of the horns and making it impossible for the plate to lie flat on the animal's forehead. The horn trainer will need tightening from time to time, but never tighten it enough to cause it to strain. When the horns are growing as desired, remove the trainer.

A horn of medium size, neatly polished, is attractive and indicates quality. The rough surface should be smoothed first with a sharp knife, then with a rasp or file, finished with fine emery paper or emery dust, and polished with a woolen cloth moistened with

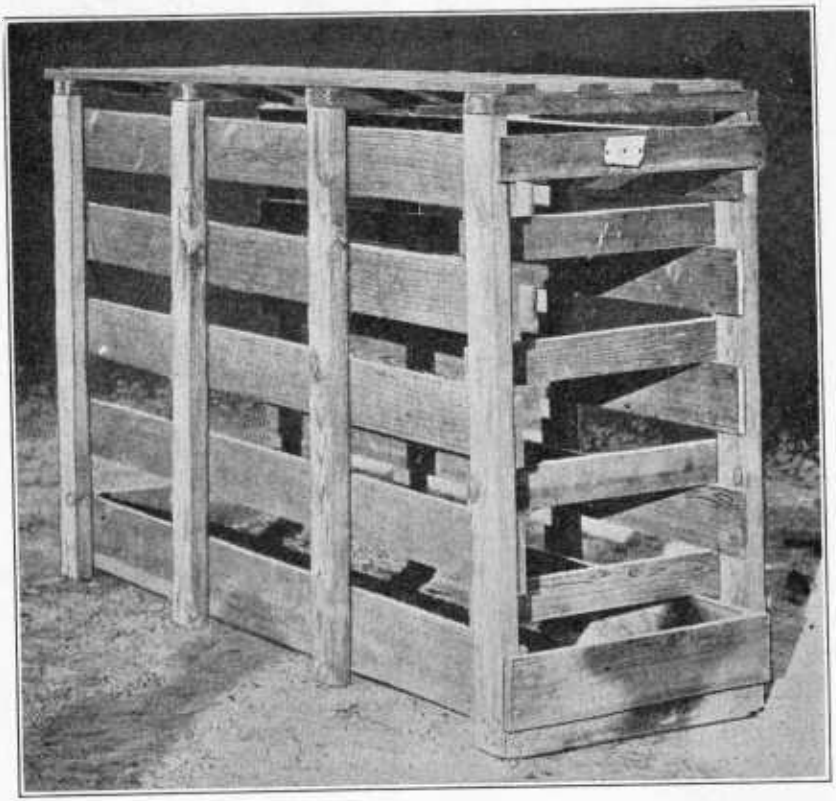


FIG. 21.—A shipping crate should be of a size suitable for the animal and securely put together

linseed oil. A polish also frequently used is sweet oil and tripoli. Sweet oil or cottonseed oil likewise may be used for this purpose.

The calf should be taken to the show or sale a day or more before the date set for it to begin. It should be taken on the train or hauled if the distance is more than a few miles. A fat calf not accustomed to walking on the road, seeing strange sights, and hearing strange noises may become greatly worried and fatigued from such a trip. Do not overheat the calf. Lead it quietly to the loading platform, if shipped by express or hauled in a wagon, and use a specially built crate (see fig. 21). If shipped in a crate or with other cattle in a box car, plenty of bedding should be provided.

Feed the calf a little less just previous to and while on the trip, especially of grain and succulent roughages. When the calf gets to the fairground or sale pavilion it will then be eager for feed. Do not feed grain as soon as it arrives, but give it plenty of water and some hay until it has rested an hour or more from the trip.

While at the show give the calf plenty of exercise; take it for a walk about the grounds in the early morning. Remember that if you are to be successful in the show or sale ring you must pay close attention to your calf. Be kind, attentive, and faithful and you will be more liberally rewarded.

The show ring is the best school you have ever attended, provided you take decisions against you as well as for you cheerfully and try to find the reasons for them. There are usually good reasons, and they will help you greatly to be more successful at the next show or sale.

MARKETING OR BREEDING—WHICH?

After a good calf has been properly grown and developed, the question "What shall I do with it?" may arise. In most cases the young owners would no doubt prefer to keep the calf. This should be done, however, only after very careful consideration. It is assumed that the calf has had a good home, that it has been welcome at all times by other members of the family, and was brought up on a farm where feeds, pasture, and equipment for caring for it properly were always available. Would these be as cheerfully provided for the mature animals as for the calf? Above all, do you have the desire to become a breeder of purebred beef cattle? Do you get real pleasure and delight in working with them and serving them? If you do, and if the home farm is well suited to the business, you are probably justified in keeping the calf for breeding purposes.

If the calf is a heifer, she of course has to be fed and cared for so as to grow into a useful cow—one good enough to be the foundation of your herd. It is important that she should have been grown, developed, and fitted for show in a way that will not limit or impair her usefulness as a breeder, whether kept by the owner or sold. Since there are so many calves that are underfed and improperly cared for, it does not seem necessary to caution against overfeeding or fitting the calf, yet it occasionally happens that the usefulness of a promising breeding animal is very materially lessened by the treatment it receives previous to breeding age.

A bull calf of desirable breeding and individuality may also be retained for breeding purposes on the home farm to advantage, although there are many reasons why a cow or heifer would be a better choice for the purpose.

A few suggestions as to the feeding and care of older animals are given, but the reader should get other publications giving more of the details if he has decided to become a breeder of purebred beef cattle.

FEED AND CARE OF THE BREEDING HEIFER

It frequently happens that the purebred heifer is well cared for as a calf but when weaned is neglected and required to shift for her-

self with the rest of the herd. This is a great mistake. While it is especially desirable that she be fed cheaply, yet the heifer kept for breeding purposes should grow all the time and be maintained in a strong, vigorous condition. As she increases in age, cheaper and more bulky feeds may be used, but they should be fed liberally. Inferior breeding animals are largely responsible for "scrubs," although the empty feed rack adds many more to the list. A daily ration of from 15 to 20 pounds of silage, 4 or 5 pounds of legume hay, with a little other dry roughage like stover straw or cheap hays, the amount depending upon the age of the heifer, will be satisfactory and economical. Silage is especially desirable for the heifer, as in the case of other beef animals. If it is not available

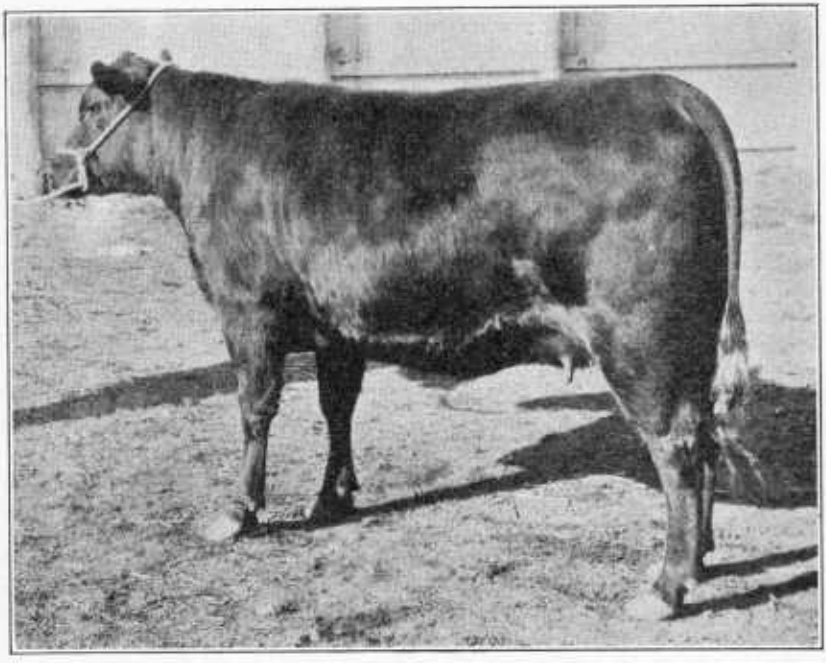


FIG. 22.—A bred heifer, properly grown, and in good condition to care for her calf

enough grain similar to that fed to the older calf should be provided, with sufficient roughages to make a satisfactory growth.

The heifer should be kept on pasture as much of the time as possible. If good pasture is available during the summer no other food will be needed until late in the fall.

The heifer may be bred when about 20 months old. The ration after that time should be sufficient for her own growth and for the development of the fetus or young calf. The mineral matter of the ration, as found in the legumes, and common salt is important for her at this time, especially the lime and phosphorus. A lack of these substances will result in a weak, small-boned calf being dropped, and the effort of the cow to supply them from her own body will weaken and stop her growth. Unless well fed and cared

for she will be unable at the same time to give sufficient milk to nourish it properly without an additional tax upon her own body.

Previous to calving time the ration, especially the bulky part of it, should be reduced and made slightly laxative. Wheat bran, oats, and linseed-oil meal are desirable for this purpose. If the animal is on pasture no special attention to the ration need be given. During the winter legume hays should be provided if possible. Use little corn, cottonseed meal, or similar feeds previous to calving.

If the heifer has been properly fed and cared for up to calving time and has had plenty of exercise she will need no assistance and little if any attention. This is especially true in good weather if

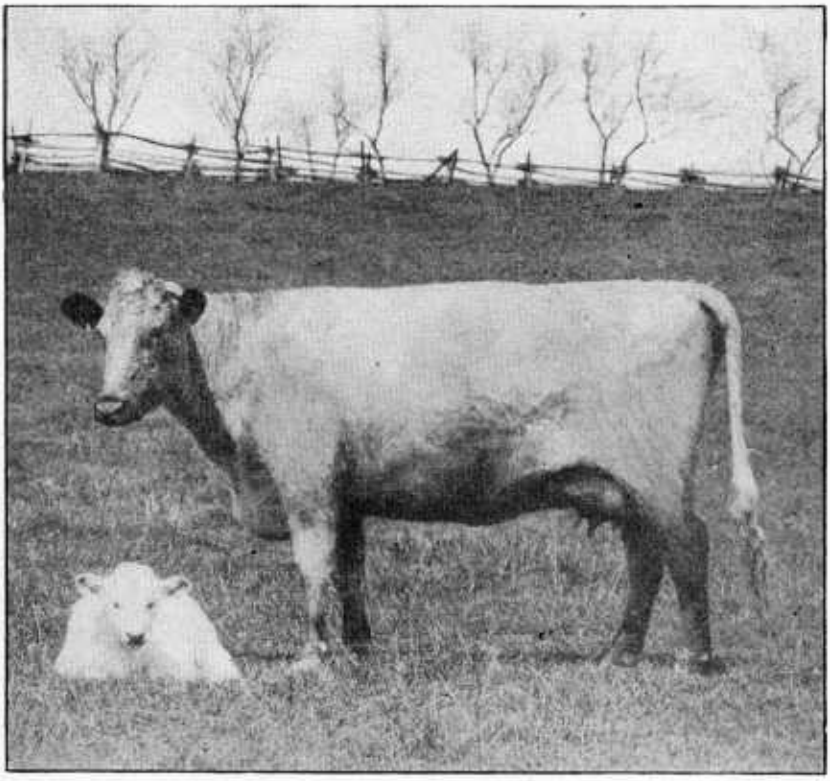


FIG. 23.—Cows that drop their calves in pasture rarely need attention at the time

the cow is allowed to calve on pasture (fig. 23). It is important that she be not disturbed by other animals. Put her into a grass lot or small pasture, if possible, by herself, away from ponds, streams, or rough, steep hillsides. In winter a well-bedded box stall should be arranged. Do not tie the cow, but give her the freedom of the stall. It is best to keep out of sight as much as possible, only observing her occasionally, to be ready to give any help needed.

After the calf has been dropped allow the cow to care for it alone. Observe them, however, to see that the calf is soon able to stand and suck. It is important that the calf get the cow's first milk.

FEED AND CARE OF THE BULL

The bull calf retained for breeding purposes, like the heifer, should not be allowed to shift for himself with the rest of the herd. He should be given a separate pasture in summer and a box stall with a lot for exercise in winter. Other bull calves or a bred cow or heifer should be put into the same lot for company. The box stall or shed should be near other cattle for the same reason.

The feeds for the bull should be similar to those for the heifer. They should be fed in sufficient quantities to keep him in a strong, vigorous condition at all times. The bull is considered as being one-half, or more, of the herd. You may, therefore, starve and stunt

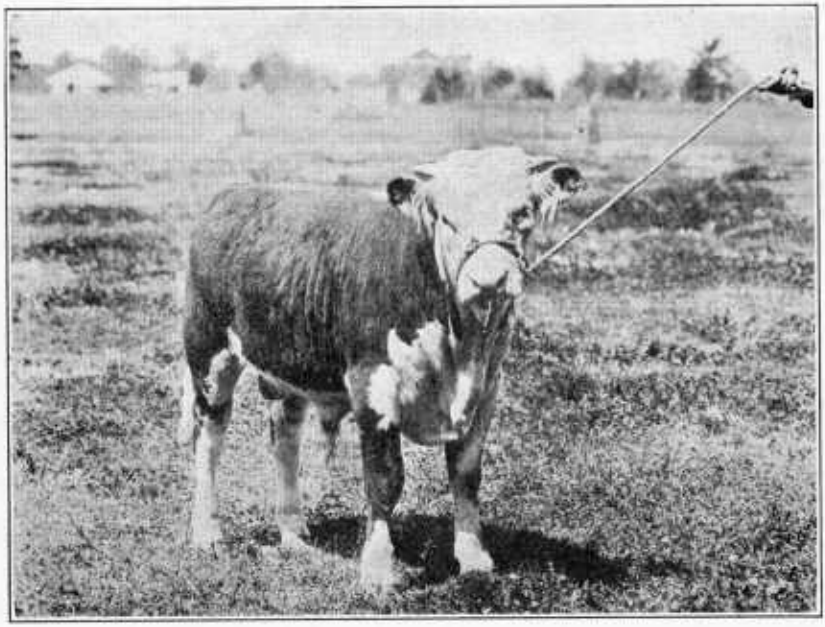


FIG. 24.—The bull calf should be taught to lead and stand correctly

the principal part of your herd by neglecting the bull and not realize the serious consequences until too late.

The bull, if well grown and cared for, may be used in a limited way for breeding purposes when 18 months old. It would be better if he were 2 years old or more before being used heavily.

It is important that the bull calf be taught to lead and to stand tied when about a year old. It will enable you to handle him more easily and with less danger to yourself. It will impress upon him the fact that you are his master, and he will soon learn to mind you as well as depend upon you for just and proper treatment.

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U. S. GOVERNMENT PRINTING OFFICE: 1933

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